i. a specula color of Bragg reflection out of controllable planar texture, and

ii. a diffusive complementary color of Bragg reflection out of controllable planar texture, and

iii. a backward scattered light out of controllable focal conic texture, and

iv. a forward scattered light out of controllable focal conic texture,

wherein the cell structure enclosing the cholesteric material within inner surfaces, attaching the circular polarizer on the back outer surface and the metal reflector at the utmost back side of the structure, and exposing the front outer surface directly to a viewer, wherein the specula color of Bragg reflection and the diffusive complementary color have a different reflecting angle, while the backward scattered light and the forward scattered light are traveling to the front of the cell structure, whereby at least one color will be displayed in the controllable planar texture area, and a bright white color will be displayed in the controllable focal conic texture area.

2. The reflective display as in claim 1 wherein the circular polarizer is an absorptive circular polarizer with its retarder side contacting the cell structure.
3. The reflective display as in claim 1 wherein the diffusive reflector is a metal reflector.
4. The reflective display as in claim 1 wherein the predetermined inner surface condition means that at least the front inner surface has a rubbed parallel alignment layer.
5. The reflective display as in claim 1 wherein the specula color of Bragg reflection has a narrow viewing angle in the range of 0~30 degree.
6. The reflective display as in claim 1 wherein the complementary color of Bragg reflection has a substantially hemispheric viewing angle, excluding the viewing angle of Bragg reflection.
7. The reflective display as in claim 1 wherein the bright white color is a pure white color.
8. The reflective display as in claim 1 wherein the reflective display is a color on white display.
9. The reflective display as in claim 1 wherein the specula color of Bragg reflection is preferably viewed in a dark ambient light condition.

10. The reflective display as in claim 1 wherein the complementary color of Bragg reflection is preferably viewed in a normal ambient light condition.
11. The reflective display as in claim 1 wherein the circular polarizer is a reflective circular polarizer.
12. The reflective display as in claim 1 further including a color filter layer positioned inside of the display cell structure and in front of the reflective circular polarizer to achieve a reflective full color display.
13. The reflective display as in claim 12 wherein the color filter is positioned in such a way that it substantially absorbs the specula color of Bragg reflection.
14. The reflective display as in claim 12 wherein the reflective full color display has a substantial hemispherical viewing angle.

4. Version with markings to show changes made

Claims: I claim:

1. A reflective display comprising:
   a. a circular display polarizer,
   b. a diffusive reflector,
   c. a plurality of transparent conductive patterned substrates juxtaposed to form a cell structure with a predetermined inner surface condition,
   d. a cholesterics material with
      i. a specula color of Bragg reflection out of controllable planar texture, and
      ii. a diffusive complementary color of Bragg reflection out of controllable planar texture, and
      iii. a backward scattered light out of controllable focal conic texture, and
      iv. a forward scattered light out of controllable focal conic texture,

   wherein the cell structure enclosing the cholesteric material within inner surfaces, attaching the circular polarizer on the back outer surface and the metal reflector at the utmost back side of the structure, and exposing the front outer surface directly to a viewer, wherein the specula color of Bragg reflection and the diffusive complementary color have a different reflecting angle, while the backward scattered

light and the forward scattered light are traveling to the front of the cell structure, whereby at least one color will be displayed in the controllable planar texture area, and a bright white color will be displayed in the controllable focal conic texture area.

2. The reflective display in claim 1 wherein the circular polarizer is an absorptive circular polarizer with its retarder side contacting the cell structure.
3. The reflective display as in claim 1 wherein the diffusive reflector is a metal reflector.
4. The reflective display as in claim 1 wherein the predetermined inner surface condition means that at least the front inner surface has a rubbed parallel alignment layer.
5. The reflective display as in claim 1 wherein the specula color of Bragg reflection has a narrow viewing angle in the range of 0~30 degree.
6. The reflective display as in claim 1 wherein the complementary color of Bragg reflection has a substantially hemispheric viewing angle, excluding the viewing angle of Bragg reflection.
7. The reflective display as in claim 1 wherein the bright white color is a pure white color.
8. The reflective display as in claim 1 wherein the reflective display is a color on white display.
9. The reflective display as in claim 1 wherein the specula color of Bragg reflection is preferably viewed in a dark ambient light condition.
10. The reflective display as in claim 1 wherein the complementary color of Bragg reflection is preferably viewed in a normal ambient light condition.
11. A reflective display comprising:

    a. reflective circular polarizer

    b. a plurality of transparent conductive patterned substrates juxtaposed to form a cell structure,

    c. a cholesteric material with

        i. a specula color of Bragg reflection out of controllable planar texture, and

        ii. a complementary color of Bragg reflection out of controllable planar texture, and

        iii. a backward scattered light out of controllable focal conic texture, and

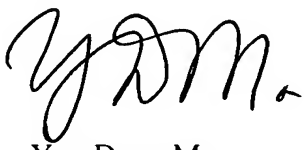
        iv. a forward scattered light out of controllable focal conic texture,

wherein the cell structure enclosing the cholesteric material within inner surface, attaching the reflective circular polarizer on the back surface, and exposing the front outer surface directly to a viewer, wherein the specula color of Bragg reflection and the complementary color travel different directions, while the backward scattered light and the forward scattered light are traveling to the front of the structure, whereby at least one color will be displayed in the controllable planar texture area, and a bright white color will be displayed in the controllable focal conic texture area.

12. The reflective display as in claim 11 wherein the reflective circular polarizer is a specula cholesteric polymer circular polarizer.
13. The reflective display as in claim 11 wherein the predetermined inner surface condition means at least the front inner surface has a rubbed alignment layer.
14. The reflective display as in claim 11 wherein specula color of Bragg reflection has a narrow viewing angle in the range of 0~30 degree.
15. The reflective display as in claim 11 wherein complementary color of Bragg reflection is substantially traveling to the backside of the display.
16. The reflective display as in claim 11 wherein the bright white color is a pure white color.
17. The reflective display as in claim 11 wherein the reflective display is a dark color on white display.
18. The reflective display as in claim 11 further including a color filter layer positioned inside of the display cell structure and in front of the reflective circular polarizer to achieve a reflective full color display.
19. The reflective display as in claim 18 wherein the color filter is positioned in such a way that it substantially absorbs the specula color of Bragg reflection.
20. The reflective display as in claim 18 wherein the reflective full color display has a substantial hemispherical viewing angle.
21. *The reflective display as in claim 1 wherein the circular polarizer is a reflective circular polarizer.*
22. *The reflective display as in claim 1 further including a color filter layer positioned inside of the display cell structure and in front of the reflective circular polarizer to achieve a reflective full color display.*

23. *The reflective display as in claim 12 wherein the color filter is positioned in such a way that it substantially absorbs the specula color of Bragg reflection.*
24. *The reflective display as in claim 12 wherein the reflective full color display has a substantial hemispherical viewing angle.*

Very respectfully,

Applicants: 

Yao-Dong Ma